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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Art Unit : 1723
Examiner : David Sorkin
Serial No. : 09/708,225
Filed : November 8, 2000
Inventor : Keith Luker
Title : EXTRUDER MIXER

22469

Docket No.: 1511-00

Dated: October 26, 2004

TRANSMITTAL LETTER

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Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

Enclosed herewith is a courtesy copy of the documents for the above-referenced patent application which were facsimile transmitted to the U.S. Patent and Trademark Office on October 25, 2004. The courtesy copy of the Appeal Brief portion of the document is submitted herewith in triplicate.

Respectfully submitted,
SCHNADER HARRISON SEGAL & LEWIS LLP

Dated: 10/26/2004

By:

Kenneth R. DeRosa
Registration No. 39,549
1600 Market Street, Suite 3600
Philadelphia, PA 19103-7286
215-751-2405 (Telephone)
215-972-7230 (Facsimile)
kderosa@schnader.com



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APPEAL BRIEF

This Brief is being filed within two months after the statutory period for filing the appeal brief as set by 37 C.F.R. § 1.192(a). A two month Extension of Time is included herewith.

Please charge the fee for filing the Appeal Brief and any other fee associated with this appeal to Deposit Account No. 13-3405. A copy of the claims involved in this appeal is appended hereto as an Appendix.

I. REAL PARTY IN INTEREST AND RELATED APPEALS AND INTER-FERENCES

The entire interest of the subject matter of this application has been assigned to Randcastle Extrusion Systems, Inc. There are no related appeals or interferences in connection with this application.

II. STATUS OF CLAIMS

Claims 3, 21-33, 36-46, and 48-54 are pending in the application. Claims 21-33 have been withdrawn from consideration by the Examiner. Claims 3 and 36-46, and 48-54 stand rejected. Claims 3, 36-46, and 48-54 are on appeal.

III. STATUS OF AMENDMENTS

A response after final rejection is submitted concurrently herewith. The response addresses the newly raised objections to the Drawings, cancels claim 47, and does not otherwise affect the issues raised on Appeal.

IV. SUMMARY OF THE INVENTION

The invention of claims 3 and 36-46, and 48-54 is directed to an extruder mixer for plasticized material comprising an elongated rotatable screw having an elongated mixing zone. The mixing zone has an inlet channel for receiving material flowing into the mixing zone and an outlet channel for delivering material out of the mixing zone. One or more intermediate channels may be disposed between the inlet and outlet channels and fluidly connect the inlet and the outlet channels. Cross-axial pumps are disposed between the inlet, outlet, and intermediate channels for drawing the material from a preceding channel to a succeeding one. When the material reaches the outlet channel, it is expelled from the mixing zone. The cross-axial pumps function to reorient the material in planar shear, maintaining elongational non-compressive flow while pumping the material between channels.

In one form of the invention, an axial barrier wall bounds the inlet channel and the outlet channel on one side for substantially preventing material from flowing therepast. Radial barrier walls can be located on the upstream and/or downstream ends to further prevent the flow of material therepast. These barrier walls help to maintain a starved condition in the mixer zone to create the elongational flow rather than the compressional flow of the prior art.

Upstream and downstream screw flights may also be provided to assist the material flow. In addition, the dimensions, shapes, and orientations of the channels can be varied to enhance the flow characteristics.

V. ISSUES

The first issue to be considered on appeal is whether independent claim 36 (and dependent claims 3, 38-46, 48, and 51-54) is unpatentable under 35 U.S.C. § 102(b) in view of U.S. Pat. No. 3,486,192 to LeRoy (the “LeRoy Patent”).

The second issue to be considered on appeal is whether dependent claim 37 is unpatentable under 35 U.S.C. § 102(b) in view of the LeRoy Patent.

The third issue to be considered on appeal is whether dependent claims 49 and 50 are unpatentable under 35 U.S.C. § 102(b) in view of the LeRoy Patent.

VI. GROUPING OF CLAIMS

Appellant submits that claims 3, 36, 38-46, 48, and 51-54 stand or fall together.

Appellant also submits that claim 37 is a separately patentable claim that stands or falls individually.

Appellant also submits that claims 49 and 50 stand and fall together.

VII. ARGUMENT

A. The Standard For § 102 Anticipation

The Commissioner (through the Examiner) bears the initial duty of establishing a *prima facie* case of anticipation. *In re Skinner*, 2 USPQ 2d 1788, 1788-89 (B.P.A.I. 1986).

Anticipation requires the presence in a single prior art reference disclosure of each and every element of the claimed invention, arranged as in the claim. *Lindemann Maschinenfabrik GmbH v. American Hoist & Derrick Co.*, 221 USPQ 481, 485 (Fed. Cir. 1984). In deciding the issue of anticipation, the Examiner must identify the elements of the claims, determine their meaning in light of the specification and prosecution history, and identify corresponding elements disclosed in the allegedly anticipating reference. *Id.* at 485. In addition, there must be no difference between the claimed invention and the reference disclosure, as viewed by a person of ordinary skill in the field of the invention. *Scripps Clinic & Research Found. V. Genentech Inc.*, 18 USPQ 2d 1001, 1010 (Fed. Cir. 1991).

Functional language in an apparatus claim is appropriate and must be afforded patentable weight by the Examiner in determining anticipation. *In re Ludtke*, 169 USPQ 563, 566 (C.C.P.A. 1971); *Ex parte Sherman*, 45 USPQ 532, 534 (Pat. Off. Bd. App. 1939). The reference disclosure must possess the capability of performing the claimed function for anticipation to be found. *Intel Corp. v. U.S. Int'l Trade Comm'n*, 20 USPQ 2d 1161, 1171 (Fed. Cir. 1991).

B. The Examiner Has Failed To Establish A *Prima Facie* Case Of Anticipation For Any Claim On Appeal

1. Independent claim 36

Independent claim 36, the sole independent claim on appeal, defines an extruder mixer for plasticized material comprising an elongated rotatable screw having an elongated mixing zone. The mixing zone has an inlet channel for receiving material flowing into the mixing zone, an outlet channel for delivering material out of the mixing zone, and a first intermediate channel that fluidly connects the inlet and the outlet channels. Cross-axial pumps are disposed between 1) the inlet channel and the first intermediate channel and 2) the first intermediate channel and the outlet channel for drawing the material from the inlet channel, into the first intermediate channel, and into the outlet channel whereupon it is expelled from the mixing zone.

Independent claim 36 specifically requires that the inlet channel and the outlet channel are bounded on one side by a “substantially axially disposed blocking wall which *substantially prevents material from flowing therepast.*” This feature is neither taught nor fairly suggested by the LeRoy Patent or any of the other cited references.

a. The LeRoy Patent

The LeRoy Patent discloses various embodiments of a rotatable extrusion mixer including a cylinder 10 which is mounted in an annular barrel 18. The cylinder includes a series of alternating inlet grooves 12 and outlet grooves 14. The inlet grooves are closed at the outlet end and the outlet grooves are closed at the inlet end by land 16. The land 16 also separates the inlet and outlet grooves 12, 14 forming a “barrier.” Col. 2, ll. 55-56. There is a “clearance” between the land 16 and the inner wall 24 of the extruder barrel 18.

In operation, resin is forced into the dead-ended inlet grooves 12 and is “forced across land 16 into the clearance between the land 16 and the extruder wall 24, down the outlet groove 12 and into the discharge end of the extruder.” Col. 3, ll. 42-48.

Le Roy defines the size of the clearance as any size that “will give a rate of shear in the extruder commensurate with that required to remove or substantially remove ‘gels’ or ‘fish eyes’ from a thermoplastic resin or depolymerize such a resin.” Col. 3, ll. 1-6. “[T]he passage of resin over the lands 16 and through the clearance between the lands 16 and wall 24 results in the development of shearing force sufficient to substantially break down” the fish eyes and depolymerize the resin. Col. 3, ll. 48-53.

Therefore, clearly LeRoy teaches that a space or clearance is formed between the lands 16 and the wall of the extruder 24 sufficient to allow the resin material to flow over the lands 16 separating the inlet grooves 12 and the outlet grooves 14. Notwithstanding the Examiner’s implications to the contrary, all the lands 16 are identical and, therefore, the clearance between the top of the lands and the inner wall 24 of the extruder barrel 18 is identical also.

In the first embodiment (FIGS. 1 and 2), LeRoy discloses a cylindrical barrel having inlet grooves having the same width and shape as the outlet grooves. In the second embodiment (FIG. 3), LeRoy discloses a cylindrical barrel similar to that of the first embodiment except that the outlet grooves are wider than the inletgrooves. Lastly, in the third embodiment, LeRoy discloses a frustoconical barrel having inlet and outlet grooves that extend along the angled lateral or axial face of the frustocone. The projection of the grooves are parallel to the longitudinal axis of the barrel.

**b. The LeRoy Patent Does Not Disclose or Suggest
Appellant's Mixer Extruder Having a Substantially Axially
Disposed Blocking Wall Which Substantially Prevents Material
from Flowing Therepast as Claimed**

The LeRoy Patent discloses that a plurality of identical lands 16 between the grooves 12 and 14. A clearance is explicitly formed between the top of lands 16 and the inner wall 24 of the barrel 18 such that resin can pass from each groove 12, "across each land 16" and into each groove 14. As such, none of the lands 16 of LeRoy function as a blocking wall capable of "substantially prevent[ing] material from flowing" between adjacent channels. In fact, all of the lands 16 of LeRoy must allow resin material to flow between adjacent grooves, as explicitly recited in the LeRoy Patent. Col. 3, ll. 1-6.

Nevertheless, the Examiner contends that "one or more of [lands] '16'" are the equivalent to Appellant's claimed "blocking wall." (Final Office Action, dated 4/13/2004, p. 4, ll. 9-11) because they "are capable of being used to perform the functions recited in the claims" (Examiner's Interview Summary Record, undated but occurring after the April 13 rejection). Moreover, at the same time the Examiner contends that "another of [lands] '16'" is the equivalent of Appellant's first cross-axial pump and "yet another of [lands] '16'" is the equivalent of Appellant's second cross-axial pump. As recited in claim 36, both pumps function to "draw[] the material from [one] channel to [another] channel."

The Examiner is, thus, taking two diametrically opposed positions. First, the Examiner contends that some of the lands 16 are capable of drawing material from one groove to another while other lands 16 are capable of blocking material from flowing past the land even though LeRoy discloses that all of the lands 16 are identical and must, necessarily function in the same way.

Therefore, the Examiner has failed to establish a *prima facie* of anticipation because the lands 16 of LeRoy are incapable of functioning as a substantially axially extending blocking wall for preventing flow of material past the lands 16 as specifically recited in appellant's claim 36.

Claims 3, 38-46, 48, and 51-54 depend from independent claim 36 and are allowable for at least the reasons given with respect to claim 36.

2. Claim 37

Dependent claim 37, which depends from independent claim 36, defines an extruder mixer in accordance with claim 36 and further wherein the inlet channel is "open at a downstream end for allowing material to flow directly out of the inlet channel to outside the mixing zone."

Notwithstanding the Examiner's conclusory assertions, all the channels 12 of LeRoy are closed (at land 16) at the downstream end. See col. 2, ll. 50-55.

Therefore, the Examiner has failed to establish a *prima facie* of anticipation with respect to claim 37.

3. Claims 49 and 50

Dependent claims 49 and 50, which depends from independent claim 36, define an extruder mixer in accordance with claim 36 and further wherein either the intermediate channel (claim 49) or the outlet channel (claim 50) "is bounded by a flight on an upstream end for preventing material to flow directly into the ... channel from outside the mixing zone.

Again, notwithstanding the Examiner's conclusory assertions, all the lands 16 of LeRoy located at the upstream end of the channels have a clearance between them and the extruder wall

24 which permit resin material to flow therepast. Thus, the dead-ended end walls (lands 16) of LeRoy cannot function to prevent material from flowing directly into the channels as claimed.

Therefore, the Examiner has failed to establish a *prima facie* of anticipation with respect to either claims 49 or 50.

VIII. CONCLUSION

For the reasons set forth above, the rejection of the claims on appeal is based on an unwarranted reference that does not anticipate the subject matter of the claims. Thus, the rejection of the claims on appeal should be reversed.

Dated: 10/25/04

By: 

Respectfully submitted,
SCHNADER HARRISON SEGAL & LEWIS LLP

Kenneth R. DeRosa
Registration No. 39,549
1600 Market Street, Suite 3600
Philadelphia, PA 19103-7286
215-751-2405 (Telephone)
215-972-7230 (Facsimile)
kderosa@schnader.com

APPENDIX

The Claims On Appeal

3. The apparatus of Claim 34 36, wherein an upstream feeder is flowingly connected to cause and to control input feed of the mixable materials.

36. (New) An extruder mixer for plastified flowable material comprising:
an elongated rotatable screw having an elongational mixing zone adapted to mix material flowing therethrough, the mixing zone having:

a substantially axially disposed inlet channel in fluid communication with a substantially axially disposed outlet channel;

both the inlet channel and the outlet channel being bounded on one side by a substantially axially disposed blocking wall which substantially prevents material from flowing therepast;

a substantially axially disposed first intermediate channel disposed between the inlet and the outlet channels and in fluid communication therewith;

a substantially axially disposed first cross-axial pump disposed between the inlet channel and the first intermediate channel, the first pump drawing the material from the inlet channel into the first intermediate channel; and

a substantially axially disposed second cross-axial pump disposed between the first intermediate channel and the outlet channel, the second pump drawing the material out of the first intermediate channel into the outlet channel to deliver the plastified material out of the mixing zone.

37. The extruder mixer according to claim 36, wherein the inlet channel is open at a downstream end for allowing material to flow directly out of the inlet channel to outside of the mixing zone.

38. The extruder mixer according to claim 36, wherein the dimensions of the channels are the same.

39. The extruder mixer according to claim 36, wherein the dimensions of the channels are different from each other.

40. The extruder mixer according to claim 36, further comprising:
at least one pair of an additional substantially axially disposed intermediate channel and cross-axial pump disposed after the second pump and in fluid communication therewith, the additional pump being disposed after the additional channel and drawing material from the additional channel into the succeeding channel and pump pair.

41. The extruder mixer according to claim 36, wherein the inlet channel blocking wall and the outlet channel blocking wall are the same.

42. The extruder mixer according to claim 36, further comprising a screw channel disposed on the rotatable screw before the input channel of the mixing zone and flowingly connected to control the flow rate of the material into the mixing zone.

43. The extruder mixer according to claim 36, further comprising an output flight flowingly connected to at least one of the blocking walls.

44. The extruder mixer according to claim 36, wherein the dimensions of the cross-axial pumps are the same.

45. The extruder mixer according to claim 36, wherein the dimensions of the cross-axial pumps are different from each other.

46. The extruder mixer according to claim 36, wherein the channels are oriented substantially parallel to the longitudinal axis of the screw.

48. The extruder mixer according to claim 36, further comprising a resistance device disposed on the screw after the mixing zone for forcing the plastic material back into said the output channel.

49. The extruder mixer according to claim 36, wherein the intermediate channel is bounded by a flight on an upstream end for preventing material from flowing directly into the intermediate channel from outside of the mixing zone.

50. The extruder mixer according to claim 36, wherein the outlet channel is bounded by a flight on an upstream end for preventing material from flowing directly into the outlet channel from outside of the mixing zone.

51. The extruder mixer according to claim 36, wherein the intermediate channel is open at an upstream end for allowing material to flow directly into the intermediate channel from outside of the mixing zone.

52. The extruder mixer according to claim 40, wherein at least one of the at least one additional channel is open at an upstream end for allowing material to flow directly into the at least one additional channel from outside of the mixing zone.

53. The extruder mixer according to claim 36, wherein the intermediate channel is open at a downstream end for allowing material to flow directly out of the intermediate channel to outside of the mixing zone.

54. The extruder mixer according to claim 40, wherein at least one of the at least one additional channel is open at a downstream end for allowing material to flow directly out of the at least one additional channel to outside of the mixing zone.